AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A process for manufacturing half-tone phase shifting mask blanks each having a phase shifting film containing at least one half-tone film on a transparent substrate,

comprising the step of providing a target containing a metal and silicon, and carrying out reactive sputtering in an atmosphere containing a reactive gas, to form said half-tone film on said transparent substrate,

wherein the formation of the half-tone film by said reactive sputtering is carried out using, as said target, a target having a metal/silicon compositional ratio selected so as to give a desired phase angle and transmissivity of the half-tone film, at a reactive gas flow rate selected from a region where a ~~reactive sputtering discharge voltage or discharge current does not show a substantial change with regard to a change in the flow rate of the reactive gas~~change in the discharge voltage is within about 20 V when the flow rate of the reactive gas changes by 10 SCCM (standard state cm^3/min).

2. (Currently Amended) A process for manufacturing a plurality of types of half-tone phase shifting mask blanks each of which has a phase shifting film containing at least one half-tone film on a transparent substrate, the half-tone film of each blank having a different optical property,

comprising the step of providing targets containing a metal and silicon and carrying out reactive sputtering in an atmosphere containing a reactive gas, to form said half-tone film on said transparent substrate,

wherein the formation of the half-tone film by said reactive sputtering is carried out using a target selected from a plurality of targets having different metal/silicon compositional ratios so as to give desired different phase angles and transmissivities among the mask blanks, at a reactive gas flow rate selected from a region where a ~~reactive sputtering discharge voltage or a discharge current does not show a substantial change with regard to a change in the reactive gas flow rate~~change in the discharge voltage is within about 20 V when the flow rate of the reactive gas changes by 10 SCCM (standard state cm^3/min).

3. (Previously Presented) The process of claim 1, wherein the reactive gas is at least one member selected from the group consisting of nitrogen, oxygen, fluorine and compounds of these.

4. (Previously Presented) Half-tone phase shifting mask blanks manufactured by the process recited in claim 1.

5. (Previously Presented) Half-tone phase shifting masks manufactured by patterning phase shifting films in the half-tone phase shifting mask blanks recited in claim 4 to form mask patterns.

6. (Previously Presented) The process for manufacturing half-tone phase shifting mask blanks as recited in claim 1 or 2, wherein the metal/silicon compositional ratio of said target is selected from a region where said target has a silicon content of 70 to 95 mol%, to obtain desired optical properties of the half-tone film.

7. (Previously Presented) The process for manufacturing half-tone phase shifting mask blanks as recited in claim 1 or 2, wherein the metal/silicon compositional ratio of said target is selected from a region where said target has a silicon content of 85 to 95 mol%, to obtain desired optical properties of the half-tone film.

8. (Currently Amended) A method of determining optimum conditions for forming a half-tone film in the manufacture of a plurality of types of half-tone phase shifting mask blanks which are for a plurality of wavelengths for exposure or which have different transmissivities, by carrying out reactive sputtering in an atmosphere containing a reactive gas using a target containing a metal and silicon, to form a phase shifting film containing at least one half-tone film on a transparent substrate,

wherein the formation of the half-tone film by said reactive sputtering is carried out using, as said target, a plurality of types of targets whose metal/silicon compositional ratios are selected such that half-tone films having desired different phase angles and transmissivities are obtained, at a reactive gas flow rate selected from a region where a ~~reactive sputtering discharge voltage or discharge current value does not show a substantial change with regard to a change in the flow rate of the reactive gas~~change in the discharge voltage is within about 20 V when the flow rate of the reactive gas changes by 10 SCCM (standard state cm^3/min).

9. (Previously Presented) The method of determining optimum conditions for forming a half-tone film as recited in claim 8, wherein the metal/silicon compositional ratios of said targets are determined in a region where said targets have a silicon content of 70 to 95 mol%, to give desired optical properties of the half-tone film.

10. (Previously Presented) The method of determining optimum conditions for forming a half-tone film as recited in claim 8, wherein the metal/silicon compositional ratios of said targets are determined in a region where said targets have a silicon content of 85 to 95 mol%, to give desired optical properties of the half-tone film.

11. (Previously Presented) A process for manufacturing half-tone phase shifting mask blanks, which comprises forming a phase shifting film containing at least one half-tone film on a transparent substrate under conditions determined according to the method recited in claim 8.

12. (Previously Presented) A process for manufacturing half-tone phase shifting masks, which comprises patterning the phase shifting films of the half-tone phase shifting mask blanks manufactured by the process recited in claim 11, to form mask patterns.

13. (Currently Amended) The process of claim 2, wherein each of the mask blanks produced has a transmission variation of ~~no more than~~ ±0.4%.

14. (Previously Presented) The process of claim 2, wherein each of the mask blanks produced has a phase shifting amount variation of ±4°.

15. (New) A process for manufacturing half-tone phase shifting mask blanks each having a phase shifting film containing at least one half-tone film on a transparent substrate, by providing a target containing a metal and silicon and carrying out reactive sputtering in an atmosphere containing a reactive gas to form said half-tone film on said transparent substrate,

the process comprising the steps of

determining a relationship between a reactive gas flow rate and a discharge characteristic of a sputtering apparatus in said reactive sputtering,

determining reactive gas flow rate conditions capable of providing mask blanks having a transmission variation of ±0.4% and having a phase shifting amount variation of ±4°, on the basis of said relationship between the reactive gas flow rate and the discharge characteristic,

forming half-tone films using targets having different metal/silicon compositional ratios under said reactive gas flow rate conditions determined, measuring the half-tone films for an

optical property and determining a relationship between the compositional ratio of the metal and silicone in the target and the optical property of the half-tone film,

determining a target composition having a metal/silicon compositional ratio that gives a predetermined optical property, on the basis of said relationship between the metal/silicon compositional ratio and the optical property of the half-tone film, and

carrying out the reactive sputtering using a target having the thus-determined target composition under the thus-determined reactive gas flow rate conditions, to form the half-tone film on each transparent substrate.

16. (New) A process for manufacturing a plurality of types of half-tone phase shifting mask blanks each of which has a phase shifting film containing at least one half-tone film on a transparent substrate, the half-tone film of each blank having a different optical property, by providing targets containing a metal and silicon and carrying out reactive sputtering in an atmosphere containing a reactive gas to form said half-tone film on said transparent substrate,

the process comprising the steps of

determining a relationship between a reactive gas flow rate and a discharge characteristic of a sputtering apparatus in said reactive sputtering,

determining reactive gas flow rate conditions capable of providing mask blanks having a transmission variation of ±0.4% and having a phase shifting amount variation of ±4°, on the basis of said relationship between the reactive gas flow rate and the discharge characteristic,

forming half-tone films using a plurality of targets having different metal/silicon compositional ratios under said reactive gas flow rate conditions determined, measuring the half-tone films for optical properties and determining relationships between the compositional ratios of the metal and silicone in the targets and the optical properties of the half-tone films,

determining compositions of a plurality of different targets having metal/silicon compositional ratios that give predetermined different optical properties, on the basis of said relationships between the metal/silicon compositional ratios and the optical properties of the half-tone films, and

carrying out the reactive sputtering using a plurality of different targets having the thus-determined target compositions under the thus-determined reactive gas flow rate conditions, to form the half-tone films.

17. (New) The process of claim 15 or 16, wherein the optical property represents light transmissivity.

18. (New) The process of claim 15 or 16, wherein the reactive gas is at least one member selected from the group consisting of nitrogen, oxygen, carbon, fluorine and compounds of these.

19. (New) The process of claim 18, wherein the reactive gas is nitrogen.

20. (New) The process of claim 15 or 16, wherein the discharge characteristic of the sputtering apparatus is a discharge voltage.

21. (New) The process of claim 20, wherein said discharge characteristic stable region is a region where a change in the discharge voltage is within about 20 V when the flow rate of the reactive gas changes by 10 SCCM (standard state cm^3/min).

22. (New) The process of claim 15 or 16, wherein the metal/silicon compositional ratio is determined in compositions having a silicon content of 70 to 95 mol% for obtaining a predetermined transmissivity of said half-tone film.

23. (New) The process of claim 15 or 16, wherein the half-tone phase shifting mask blanks are mass-produced.

24. (New) A process for the production of a half-tone phase shifting mask, which comprises patterning a phase shifting film of a half-tone phase shifting mask blank obtained by the process recited in claim 15 or 16 to form a phase shifting film pattern on the transparent substrate.

25. (New) The process of claim 1 or 2, wherein the half-tone phase shifting mask blanks are mass-produced.

26. (New) The process of claim 1 or 2, wherein each of the mask blanks produced has a transmission variation of no more than 1 %.

27. (New) The process of claim 1 or 2, wherein each of the mask blanks produced has a phase shifting amount variation of no more than ±5°.